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Web Services on Instant Messaging

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***Abstract*—In this evolving technological environment there are many useful web applications developing at a faster rate. With such a wide range of web applications available, there is no easy way to be connected with all those applications at a single place. These web applications can be accessed via a web browser or its dedicated mobile application. This paper aims to present a centralized approach where the users can access all the available web applications via instant messenger. In this system, using artificial intelligence a chat bot is developed, with whom the users communicate via instant messenger. Along with replying requests like human beings, the chat bot will also serve the users requests to access the web applications in real time. The instant messenger applications works well even in low speed internet connection and no dedicated hardware or high end devices are needed. Also the bandwidth usage and device storage space for dedicated applications is minimized. Unlike voice based personal assistant this system is more practical to use even in noisy environment.**

***Index Terms*— Instant messaging application, Web Services, Natural language processing.**

I. INTRODUCTION

In today's world with vast development and evolution in technological department the word "impossible" is getting diminished day by day. Along with the development of technology the number of people engaged in the use of technology is increasing widely. Mobile technology nowadays is not the same which it was earlier, it has surpassed its technology to an extent where a mobile phone is not just a device to connect a call or receive a call, it serves the user with multiple services and this is not the limit, this technology is still going on evolving at much faster rate.

Instant Messaging applications are the applications which were once developed to convey messages in an organization or institute. These applications are nowadays emerged in such a way that they became an application for communication. There are multiple Web Services in the world, hundreds of web services serving the same services or jobs. Finding out the proper and accurate services and then getting a hand to it is other tiresome process.

Integrating such services at one point where they will be serving as per the request could simplify the work. Instant messaging is an application which has one of the widest reach of the user. Integrating multiple web services in an existing instant messaging application will make user work lot much easier and the web services will reach at the vast extent serving as many user as possible. This technique will make mobile technology much more optimal then it was before. There are multiple application present currently but mostly every one of them serves a particular services. Thus if user need five services he need to install five

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different application serving the user needs. This eventually result in consuming more memory, disk space etc. Maintaining account details for all those application is another hurdle. Integrating it on a single existing chat application will cut down many hurdles and making user free to access multiple web services through a single point. It is designed to minimize the efforts, time and internet bandwidth used to access the Web Applications directly from Instant Messaging client using Web Services, which would otherwise have to be accessed manually via browser or different applications. With this service, users will be able to access various web applications via a slow internet connection utilizing minimum data consumption.
More specifically, this system is designed to allow the user to check different Web Application accounts and browse through various Web Applications without using any specific application except the Instant Messaging client. The system will facilitate customization to the users for setting personal configuration about the different Web Applications they are interested in. The system will create an account for each user and will maintain the configuration of every account within its server. The system will also maintain the authorization tokens required to access the various Web Applications on behalf of users like E-Mail.

II. METHODOLOGY

A. Instant messaging

Instant messaging was created in July of 1996 by 4 young Israeli avid-computer users. They started company called Mirabilis in order to introduce a new way of communication over the Internet [4]. Then with further development it emerged out to be an application for communication purpose. In today's world instant messaging application is said to be the one of the most widely used application.
There are multiple company providing the instant messaging services. Each service has an own Application Programming Interface (API) which can be used to develop interactive applications. Some of the API might be open source project. Companies provide an open source API to help developer develop and evolve that service further using those API. Some of the service providers have a closed API for security reason.

B. Web services

A Web service is a method of communication between two electronic devices over a network. The provider who provides web services are called the service provider. User can use intermediator software or application to access web services rather than going to a central server. The intermediator software through which user can access the web service is also termed as client side application. Currently there are thousands of web services available.
SOAP, REST and JSON are some of the specification of web services.
1) SOAP: Simple Object Access Protocol (SOAP) it is one of the most famous protocol for accessing web services over internet. It is the mode of communicating and sending messages between two applications. It is based on Extensible Markup Language. SOAP uses the most widely used communicating protocol HTTP to communicate irrespective of Operating System and programming languages [2][3]. Web Service Description Language (WSDL) along with Universal Description, Discovery and Integration (UDDI) included SOAP as their part originally. Setting it free SOAP is now used without WSDL and UDDI [2].
2) REST: REST stands for Representational State Transfer. It is another most famous protocol for accessing and developing web services. Less amount of volume is consumed while interacting being less verbose. It is also used for building scalable web services.
3) JSON: JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write. It is easy for machines to parse and generate. It is based on a subset of the JavaScript Programming Language, Standard ECMA262 3rd Edition - December 1999. JSON is a text format that is completely language independent but uses conventions that are familiar to programmers of the C-family of languages, including C, C++, C#, Java, JavaScript, Perl, Python, and many others. These properties make JSON an ideal data-interchange language.[1]
REST was defined by Roy Thomas Fielding in his 2000 PhD dissertation "Architectural Styles and the Design of Network-based Software Architectures". [5]

III. ARCHITECTURE

The above figure clearly shows how the system is being accessed. The main focus is to integrate various Web Applications through its available Web Services so that they can be accessed from a centralized place, Instant

Messaging in this system. As IM application are widely used and that they work in real time, makes it very good place where various Web Services can be integrated. So the final outcome of this system is that the user

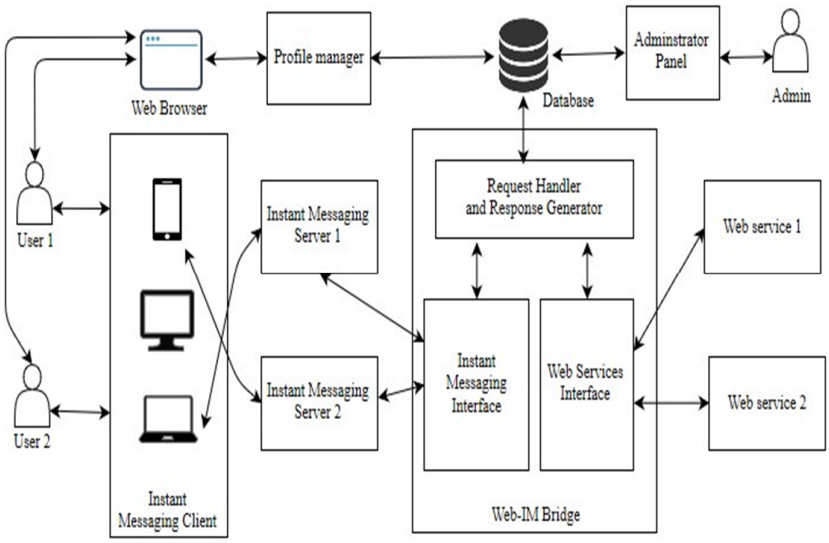

Figure 1. System Architecture

will be able to interact with most of the Web Applications directly from their IM Client, just like they chat with other people. They are not force to download any applications of particular service, hence everything is integrated in a single IM Client application which will in fact utilize minimum bandwidth and will respond instantly.

1) Profile manager: This is the web portal that acts like a front end for managing web services. Here the users can create an account and register for any of the available services that they are interested in. Here the users provides the server to access their accounts via web application tokens.

2) Web-IM Bridge: Web-IM Bridge is the centralized component which acts as an interface between the IM Client and the Web Services. Web-IM Bridge consists of three interfaces,

a) *IM Interface*: This interface will handle all the IM related functions. Listing to all the inbound messages on its ID and responding to the specified user ID with messages are the basic function of this Interface. It helps the Web-IM Bridge to communicate with the users. Instant messaging interface will create a private session for each of the client. User can send multiple request to the IM bot once the session has started.

b) *Web Service (WS) Interface:* This interface will be handling all the functions required to access any particular WS. The interface creates a communication Bridge between WS and Web-IM Bridge which allows the system to access WS on behalf of users. The token provided by users in their profile is used here.

c) *Request handler and response generator:* This interface will be used to identify all the users and their requests accurately, also forwarding the valid responses, using the IM Interface. It will accordingly use the WS Interface to access data from WS that the user will request which will be used to create a valid response. Request handler will use Natural language processing and identify users request accurately, also an appropriate response is generated for the result fetched.

IV. RESULT

- Unlike voice based assistant services this system can work within noisy environment.
- This system will only require a device with basic hardware configuration that can support instant messaging application.
- This system will communicate using only text messages at most of the time. Hence, doesn't required high speed data connection. This system will be beneficial while the users travel around and are connected via low speed connections like GPRS.

- Instead of browsing multiple web pages or different applications, this system will provide the users single place to access all the web services that they are interested in.

V. CONCLUSION

Once the system architecture is implemented, services will be readily available for the user directly on the instant messaging application. It can be used on different device supporting instant messaging application such as tab, mobile phones, laptop etc. Multiple web services will be available to the user with the implementation of this idea. This system can be implemented for real time notifications, automated customer support etc.

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